

MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for November, 1903, is based on data from about 3300 stations, classified as follows:

Weather Bureau stations, regular, telegraph and mail, 166; West Indian Service, cable and mail, 15; River and Flood Service, 52, river and rainfall, 177, rainfall only, 62; voluntary observers, domestic and foreign, 2565; total Weather Bureau Service, 2962; Canadian Meteorological Service, by telegraph and mail, 20, by mail only, 13; Meteorological Service of the Azores, by cable, 2; Meteorological Office, London, by cable, 8; Mexican Telegraph Company, by cable, 3; Army Post Hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Company, 96; Hawaiian Meteorological Service, 75; Jamaica Weather Service, 130; Costa Rican Meteorological Service, 25; The New Panama Canal Company, 5; Central Meteorological Observatory of Mexico, 20 station summaries, also printed daily bulletins and charts, based on simultaneous observations at about 40 stations; Mexican Federal Telegraph Service, printed daily charts, based on about 30 stations.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Territorial Meteorologist, and Mr. R. C. Lydecker, Acting Territorial Meteorologist, Honolulu, H. I.; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; Lieut. Commander W. H. H. Southerland, Hydrographer, United States Navy; H. Pittier, Director of the Physico-Geographic Institute, San José,

Costa Rica; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. N. Shaw, Esq., Secretary, Meteorological Office, London; Rev. Josef Algué, S. J., Director, Philippine Weather Service; and H. H. Cousins, Chemist, in charge of the Jamaica Weather Office; Señor Enrique A. Del Monte, Director of the Meteorological Service of the Republic of Cuba.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is $157^{\circ} 30'$, or $10^{\text{h}} 30^{\text{m}}$ west of Greenwich. The Costa Rican standard of time is that of San José, $0^{\text{h}} 36^{\text{m}} 13^{\text{s}}$ slower than seventy-fifth meridian time, corresponding to $5^{\text{h}} 36^{\text{m}}$ west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

Barometric pressures, whether "station pressures" or "sea-level pressures," are now reduced to standard gravity, so that they express pressure in a standard system of absolute measures.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

The marked features of the month were (1) the frequency of north Pacific coast lows, (2) the rapidity of storm movement, and (3) the cold wave of the 16-19th.

The forecasts and warnings were timely and as a rule accurate. The warnings issued in connection with the advance of the cold wave of the 16-19th over Texas and Louisiana were especially valuable to the sugar interests of those States. It is estimated that sugar cane to the value of \$2,000,000 was cut in the thirty-six hours preceding the fall in temperature.

On the opening days of the month quiescent weather prevailed under the influence of an area of high pressure that had occupied the middle and eastern districts since October 27. On the night of the 2d, the official forecaster at the Central Office, Prof. E. B. Garriott, issued the following statement:

Observation has shown that periods of low barometric pressure over the British Isles are attended by stagnated weather conditions over the western Atlantic and the eastern part of the American Continent, and that five to six days after reestablishment of normal barometric pressures over the eastern Atlantic, the usual progression of areas of high and low barometer over the United States is resumed. An instance of this kind has been presented during the past week. On Friday last an area of low barometer that had occupied the British Isles for several days began an eastward movement, and to-day the high barometer area that has persistently occupied the east-central part of the United States since last Tuesday shows signs of dissolution. The effect of these barometric changes will probably be shown in a gradual breaking up of the quiescent weather conditions that have prevailed since the 27th ultimo over the eastern part of the United States. There are at present, however, no

indications of the development of a well-marked storm in the United States.

The p. m. reports of the 3d gave the first indications of renewed storm activity. A moderate depression then appeared off the Washington and Oregon coasts, and at the same time an area of high pressure began a southeasterly movement from Alberta. To the eastward of the last-named area, a shallow depression deepened somewhat and moved eastward, forming an elongated trough-like disturbance that passed off the Atlantic coast on the 5th. It was accompanied by general rains from the Mississippi Valley eastward and snows in the Lake region and northern portion of the Middle Atlantic States and New England.

In Washington the snow was the earliest noted since 1891, when snow fell on November 5. The average date of first snow in Washington is November 21, the earliest date October 14, 1876, and the latest date December 29, 1871.

The north Pacific coast storm of the 3d moved slowly inland and inaugurated a period of rainy weather in Washington and Oregon, that persisted with but few interruptions until the end of the month. Its movement eastward was very slow; it reached its maximum development on the morning of the 6th, with a barometer reading of 29.20 inches at Edmonton, and passed beyond the field of observation on the 7th. A second area of low pressure apparently developed over the Plateau